

## CLAIMS

- 1           1.     A composite material comprising:  
2               a first component which is a metal phosphate; and  
3               a second component which is selected from the group consisting of:  
4     metal nitrides, metal oxynitrides, and combinations thereof.
  
- 1           2.     The material of claim 1, wherein said metal phosphate is a  
2     lithiated metal phosphate.
  
- 1           3.     The composite material of claim 1, wherein said first component  
2     comprises a core and said second component is present on at least a portion of  
3     the surface of said core.
  
- 1           4.     The composite material of claim 1, wherein said second  
2     component is disposed in at least a portion of the bulk of said first component.
  
- 1           5.     The composite material of claim 1, wherein said metal  
2     phosphate is a transition metal phosphate.
  
- 1           6.     The composite material of claim 5, wherein said transition metal  
2     is selected from the group consisting of Fe, V, Mn, and combinations thereof.

1           7.     The composite material of claim 1, wherein said first component  
2     has an olivine or nasicon structure.

1           8.     The composite material of claim 1, wherein said second  
2     component is selected from the group consisting of transition metal nitrides,  
3     transition metal oxynitrides, and combinations thereof.

1           9.     The composite material of claim 1, further including a dopant.

1           10.    The composite material of claim 9, wherein said dopant is  
2     selected from the group consisting of: carbon, a metal ion having a +2 valence,  
3     a metal ion having a +3 valence,  $\text{Nb}^{+5}$ ,  $\text{Zr}^{+4}$ ,  $\text{Ti}^{+4}$ ,  $\text{W}^{+6}$ , and combinations  
4     thereof.

1           11.    The composite material of claim 1, wherein said first component  
2     is substitutionally doped at the phosphate site by a member selected from the  
3     group consisting of: halogens,  $(\text{SO}_4)^{-2}$ ,  $(\text{SiO}_4)^{-4}$ ,  $(\text{TiO}_4)^{-4}$ ,  $(\text{AlO}_3)^{-3}$ , and  
4     combinations thereof.

1           12.    An electrode comprising a composite material, said composite  
2     material comprising: a first component which is a metal phosphate, and a  
3     second component which is selected from the group consisting of: metal  
4     nitrides, metal oxynitrides, and combinations thereof.

1           13.    The electrode of claim 12, wherein said metal phosphate is a  
2   lithiated metal phosphate.

1           14.    The electrode of claim 12, wherein said first component  
2   comprises a core and said second component is present on at least a portion of  
3   the surface of said core.

1           15.    The electrode of claim 12, wherein said second component is  
2   dispersed in at least a portion of the bulk of said first component.

1           16.    The electrode of claim 12, wherein said first component is a  
2   transition metal phosphate.

1           17.    The electrode of claim 16, wherein said second component is  
2   selected from the group consisting of transition metal nitrides, transition metal  
3   oxynitrides, and combinations thereof.

1           18.    The electrode of claim 12, where said metal phosphate has an  
2   olivine or a nasicon structure.

1           19.    The electrode of claim 12, wherein said composite material  
2   includes a dopant.

1           20.    A method of making a composite material, said method  
2    comprising the steps of:

3           providing a plurality of precursor compounds, said precursor  
4    compounds including: a metal containing compound, a lithium containing  
5    compound, and a phosphorous containing compound;

6           mixing said plurality of precursor compounds so as to form a mixture  
7    thereof;

8           calcining said mixture so as to produce a lithiated phosphate of said  
9    metal; and

10          subjecting said lithiated phosphate of said metal to a nitriding process  
11    wherein a portion of said lithiated phosphate of said metal is converted to a  
12    nitride or an oxynitride of said metal.

1           21.    The method of claim 20, wherein the step of mixing comprises  
2    milling.

1           22.    The method of claim 21, wherein said step of milling comprises  
2    ball milling.

1           23.    The method of claim 20, wherein said compound of a metal  
2    comprises a compound of at least one transition metal.

1           24.    The method of claim 23, wherein said transition metal is  
2           selected from the group consisting of: Fe, V, Mn, and combinations thereof.

1           25.    The method of claim 20, wherein the step of providing a  
2           plurality of precursor compounds further comprises providing a dopant  
3           precursor compound.

1           26.    The method of claim 25, wherein said dopant precursor  
2           compound includes a member selected from the group consisting of: Nb, Mg,  
3           Zr, Ti, Al, and combinations thereof.

1           27.    The method of claim 20, wherein the step of subjecting said  
2           lithiated phosphate of said metal to a nitriding process comprises heating said  
3           lithiated phosphate of said metal to an elevated temperature in the presence of a  
4           nitriding atmosphere.

1           28.    The method of claim 27, wherein said nitriding atmosphere  
2           includes ammonia.

1           29.    A lithium battery having a cathode comprised of a composite  
2           material said composite material comprising a first component which is a  
3           lithiated transition metal phosphate having an olivine or nasicon structure, and

4 a second component which is selected from the group consisting of transition  
5 metal nitrides, transition metal oxynitrides, and combinations thereof.

1 30. The battery of claim 29, wherein said composite material further  
2 includes a dopant.

1 31 The battery of claim 29, wherein said first component of said  
2 composite material comprises a core and said second component is present on  
3 at least a portion of the surface of said core.

1 32. The battery of claim 29, wherein said second component of said  
2 composite material is disposed in at least a portion of the bulk of said first  
3 component of said composite material.